

Serial No. 09/988,688

Attorney Docket No. 11-073-RCE

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CENTRAL FAX CENTER****DEC 11 2006****LISTING OF CLAIMS:**

The following listing of claims replaces all previous versions and listings in the present application.

1. (Previously presented) A spark plug comprising:

a metal shell;

a center electrode retained in said metal shell and insulated from said metal shell; and

a ground electrode extending horizontally from said metal shell and opposed to an outer peripheral surface of said center electrode to define a spark gap between said ground electrode and said center electrode, said ground electrode being connected to said metal shell through a laser fused weld having a predetermined melt depth d ,

wherein said ground electrode has a second tip end facing the outer peripheral surface substantially along a line extending perpendicular to the longitudinal center line of said center electrode and intersecting the outer peripheral surface,

wherein the depth of the weld between said ground electrode and said metal shell is about 0.3 mm to 1.5 mm, and

wherein said metal shell is made of an Fe-base alloy containing one of 0.15% by weight or less of S, 0.35% by weight or less of Si, 0.25% by weight or less of C, 1.5% by weight or less of Mn, and 0.1% by weight or less of P.

2. (Previously presented) A spark plug as set forth in claim 1, wherein the whole of said ground electrode is made of an alloy and connected at an end thereof directly through the laser fused weld to said metal shell.

3. – 4. (Canceled)

Serial No. 09/988,688

Attorney Docket No. 11-073-RCE

5. (Original) A spark plug as set forth in claim 1, wherein said metal shell is made of an Fe-base alloy containing 0.15% by weight or less of S, 0.35% by weight or less of Si, 0.25% by weight or less of C, 1.5% by weight or less of Mn, and 0.1% by weight or less of P.
6. (Original) A spark plug as set forth in claim 1, wherein said ground electrode is made of an alloy containing a main component of 50 Wt % or more of Pt and an additive of at least one of Rh, Ir, Os, Ni, W, Pd, and Ru.
7. (Original) A spark plug as set forth in claim 1, wherein said ground electrode is made of an alloy containing a main component of 50 Wt % or more of Ir and an additive of at least one of Rh, Pt, Os, Ni, W, Pd, and Ru.
8. (Previously presented) A spark plug as set forth in claim 1, wherein said ground electrode is made of an Ir alloy including a main component of 50 Wt% or more of Ir and connected directly to said metal shell.
9. (Canceled).
10. (Previously presented) A spark plug as set forth in claim 2, wherein the depth of the weld between said ground electrode and said metal shell is about 0.3 mm to 1.5 mm.
11. (Original) A spark plug as set forth in claim 8, wherein said metal shell is made of an Fe-base alloy containing one of 0.15% by weight or less of S, 0.35% by weight or less of Si, 0.25% by weight or less of C, 1.5% by weight or less of Mn, and 0.1% by weight or less of P.

Serial No. 09/988,688

Attorney Docket No. 11-073-RCE

12. (Original) A spark plug as set forth in claim 8, wherein said metal shell is made of an Fe-base alloy containing 0.15% by weight or less of S, 0.35% by weight or less of Si, 0.25% by weight or less of C, 1.5% by weight or less of Mn, and 0.1% by weight or less of P.

13. (Original) A spark plug as set forth in claim 8, wherein said ground electrode is made of an alloy containing a main component of 50 Wt % or more of Ir and an additive of at least one of Rh, Pt, Os, Ni, W, Pd, and Ru.

14. (Canceled)

15. (Previously presented) A spark plug as set forth in claim 1, wherein the center electrode includes a tip portion made of an Ir alloy.

16. (Canceled)

17. (Previously presented) A spark plug as set forth in claim 1, wherein the center electrode includes a tip portion made of a Pt alloy.

18. (Previously presented) A spark plug as set forth in claim 8, wherein the center electrode includes a tip portion made of an Ir alloy.

19. (Canceled)

Serial No. 09/988,688

Attorney Docket No. 11-073-RCE

20. (Previously presented) A spark plug as set forth in claim 8, wherein the center electrode includes a tip portion made of a Pt alloy.

21. (Canceled)

22. (Previously Presented) A spark plug as set forth in claim 1, wherein said ground electrode extends directly from said metal shell in a direction perpendicular to the longitudinal center line of said center electrode.

23. (Currently amended) A spark plug comprising:
a metal shell;
a center electrode retained in said metal shell and insulated from said metal shell; and
a ground electrode extending horizontally from said metal shell and opposed to a first tip end of said center electrode to define a spark gap between said ground electrode and said center electrode, said ground electrode being connected to said metal shell through a laser fused weld having a predetermined melt depth d ,

wherein said ground electrode has a second tip end facing the first tip end of said center electrode, substantially along a longitudinal center line of said center electrode and wherein the laser fused weld is located far from the second tip end to avoid a rise in temperature of the weld,

wherein the depth d of the weld between said ground electrode and said metal shell is between from about 0.3 mm to about 1.5 mm, and

Serial No. 09/988,688

Attorney Docket No. 11-073-RCE

wherein said metal shell is made of an Fe-base alloy containing one of 0.15% by weight or less of S, 0.35% by weight or less of Si, 0.25% by weight or less of C, 1.5% by weight or less of Mn, and 0.1% by weight or less of P.

24. - 25. (Canceled)

26. (Previously presented) A spark plug as set forth in claim 23, wherein said metal shell is made of an Fe-base alloy containing 0.15% by weight or less of S, 0.35% by weight or less of Si, 0.25% by weight or less of C, 1.5% by weight or less of Mn, and 0.1% by weight or less of P.

27. (Previously presented) A spark plug as set forth in claim 23, wherein said ground electrode is made of an alloy containing a main component of 50 Wt % or more of Pt and an additive of at least one of Rh, Ir, Os, Ni, W, Pd, and Ru.

28. (Previously presented) A spark plug as set forth in claim 23, wherein said ground electrode is made of an alloy containing a main component of 50 Wt % or more of Ir and an additive of at least one of Rh, Pt, Os, Ni, W, Pd, and Ru.

29. (Previously presented) A spark plug as set forth in claim 23, wherein said ground electrode is made of an Ir alloy including a main component of 50 Wt% or more of Ir and connected directly to said metal shell through the laser fused weld.

Serial No. 09/988,688

Attorney Docket No. 11-073-RCE

30. (Previously presented) A spark plug as set forth in claim 23, wherein the center electrode includes a tip portion made of an Ir alloy.

31. (Previously presented) A spark plug as set forth in claim 23, wherein the center electrode includes a tip portion made of a Pt alloy.

32. (Currently amended) A spark plug as set forth in claim 23, wherein the laser fused weld includes a predetermined number of fused portions associated with a desired strength according to a relation whereby[[,]] the predetermined number is decreased to increase the joint strength of the laser fused weld.